

## REMARKS

Claims 1, 5, 6, 35, 36, 37, 40, 41, 42, 43, 51, 52, 53, 54, 55 are amended to correct a grammatical error: “criterion” is now used for the singular and “criteria” for the plural. The same amendment is made to other claims which are amended for additional reasons.

### Claims Rejections-35 USC 112 second paragraph

Claim 16 is rejected for reciting the limitation “a bounded subfield area” in referring to the map area, on grounds that there is insufficient antecedent basis for this limitation. Claim 16 is amended to clarify that the bounded subfield area is one of the bounded subfield areas corresponding to and representing a product, as introduced in claim 7.

### Claims Rejections-35 USC 102 and 103

Claims 1-6, 34-45, and 49-59 stand rejected under 35 USC 102 over Wattenberg, and claims 7-31 and 46-48 stand rejected under 35 USC 103 over the combination of Wattenberg and U.S. Patent 5,960,411 (Hartman et al) herein referred to as Hartman. The rejections are avoided by amendment as explained below.

Regarding the 35 USC 103 rejections, Hartman discloses only one-click purchasing systems, not tree maps. The amendments, as argued below, distinguish the claimed invention mainly from Wattenberg. Harman generally cannot provide the missing elements as they cover assembling and manipulating tree map displays.

### Active Server and Partitioned Application Thereby Created

Claims 1- 49, and 51-56, as amended are limited to require an active server rather than a passive database. New claim amendments are drawn to embodiments based on a partitioned application using an active server, which is different from the passive database disclosed in Wattenberg. Amendments to claim 1 are representative. Claim 1 as amended recites in part:

initiating a network communication session between a client computer and a server computer;

executing a host process on the server computer that receives user criteria that specify a subset of the data elements with respect to multiple data criteria;

on the server computer, identifying a subset of data from a database that meets the user criteria; and

on the server computer, constructing one or more data objects that represent the data subset, and communicating the data objects to the client computer.

executing a display process running as an applet in a browser on the client computer

The system as claimed, with a partitioned application using an active server rather than a passive database, has the following advantages over Wattenberg:

(1) Since the database itself is not exposed to the client application, but rather “hidden” behind the active server, the active server provides an additional layer of abstraction. This abstraction layer permits such services as finding and aggregating data from one or more data stores linked over the Internet, as described in the specification on page 10 lines 12-14 and on page 8 lines 7-10, rather than being limited to a single database schema. The step of “identifying a subset of data from a database that meets the user criteria” discloses that the server does more than simply perform a Structured Query Language (SQL) statement on the database, since it is also disclosed on page 10 lines 12-14 that the term “database” is intended to encompass one or more data stores linked over the Internet, rather than, say, a single instance of Oracle or MySQL. The server could also inherently perform “information-hiding”, i.e. exposing only a limited set of data element names, which may have certain security advantages over a more general database access protocol such as ODBC or JDBC. Finally, the server has the inherent ability to detect repetitive patterns in textual data items, e.g. city names or employee names, and encode them in very efficient ways, e.g. Huffman coding, as if they had been defined like an “enumerated type” in a conventional programming language.

(2) Unlike a passive database, an active server has the inherent ability to filter and format data according to the unique characteristics of the display device. For example, claim 24 below adds a limitation related to the use of hand-held devices. Whereas a passive database would be unlikely to consider the limited memory, processing power, and display space of a hand-held device, and would thus overwhelm it with inappropriately sized and formatted data, an active server could pre-process the data so as to reduce the demands on the device, e.g. filtering it down, or sending the data in a more highly compressed format.

(3) Unlike a passive database, an active server can inherently “watch” the actions of the client in order to create profiles. For example, when a user groups or filters the data, data could be sent from client to server, which enables the server to remember what paths a particular user took through the data. Additionally, the length of time that a user lingers over a cell, presumably looking at the subfield detail window, is relevant information about the data, and could be used to tailor tree maps for other similar users, or return information to the product vendors to help tailor future advertising or promotions.

(4) The claim language “executing a display process running as an applet in a browser on the client computer” limits coverage to applications inherently capable of running on a client computer having a standards-compliant browser, and applications inherently requiring no installation step on the client computer. Thus, the application could be “published” and made available to a vast community of net-connected users, without the cumbersome and trouble-prone process of software installation on each user’s computer that would be required by the system disclosed in Wattenberg.

Wattenberg only discloses a database and a passive web server at 80, and on column 8 lines 23-24. There is no active server disclosed or implied, as required by the amended claims.

Regarding “initiating a network communication session between a client computer and a server computer”, support for which can be found in the specification on page 23 line 14: Wattenberg does not teach or suggest that a network communication session is initiated as a first step, or that the application is thus partitioned across a network. Wattenberg teaches only an interface system (column 8 lines 17-

30) with a database structure or other tool that provides access to the specific data, which is different from the partitioned application of this claim language and others discussed herein.

Regarding “executing a host process on the server computer that receives user criteria”, support for which can be found in the specification at page 25, lines 20-21: Wattenberg does not teach or suggest that the host process that receives user criteria runs on a server computer, separate from the computer running the display process.

Regarding “on the server computer, identifying a subset of data”, support for which can be found in the specification at page 26, line 1-3: Wattenberg does not teach or suggest that a server computer identifies a subset of data from a database that meets user criteria.

Regarding “on the server computer, constructing one or more data objects that represent the data subset, and communicating the data objects to the client computer”, support for which can be found in the specification at page 26, line 5-6: Wattenberg does not teach or suggest that a server computer constructs one or more data objects that represent the data subset, and communicates the objects to the client computer.

Regarding “executing a display process running as an applet in a browser”, support for which can be found in the specification on page 5 line 8; page 7 line 19; page 8 line 3-6; page 23 lines 5 and 17-18; page 24 lines 5-8; page 25 lines 3-8: Wattenberg does not teach or suggest that the tree map application run as an applet in a browser.

#### Data Exploration

New claims 60- 66 and 69-79 are limited to require various data exploration capabilities not taught or suggested in the prior art of record. Generally, the claims are drawn to tree map embodiments with features beyond the mainly passive display tools contemplated by the prior art. Claim elements cover data exploration tools, which might permit the user to interact with the data and reconfigure the tree map “on the fly”, repeatedly, in ways governed only by the data and the user’s wishes, not in ways preconfigured for specific purposes.

Claims 60-66, 70, and 78 comprise a “highlight box by which one or more subfield areas meeting one or more user specified criteria are highlighted with one or more symbols associated with the criteria” limitation. Support for it can be found in the specification from page 20, line 18 to page 21, line 9; at 1366 in the drawings; and page 41 line 4-15. The invention as now claimed allows for one or more items to be highlighted repeatedly under the control of the user, according to whether they meet a specified criterion of interest to the user. Thus, a user can readily visualize presence or absence of features of interest on the tree map, as well as coincidence of multiple features.

Wattenberg does not disclose an equivalent feature. The reference shows “find control 904”, which is designed for identifying the location of a single stock or company, and not visually enhancing the tree map view to serve a user’s research needs. Wattenberg also discloses on column 17 lines 40-50 that the regions can be divided into two or more parts, each part having a different visual indication. This, however, does not disclose highlighting under user control, and that multiple highlight criteria can be turned on and off independently by the user as needed. Consequently, the system of Wattenberg can display only preconfigured attributes, and only in a limited number as the tree map would otherwise become excessively cluttered. The lack of user control over display of features of interest makes the Wattenberg system particularly ill-suited for customized research of a large number of underlying variables. In sum, the system as now claimed is superior to Wattenberg because entire categories of subfield areas can be reversibly highlighted, which permits data exploration operations.

Claims 60-66, 78 comprise another feature of the claimed embodiments, “displaying a menu item by which the factors which govern the bounded field areas are changed, such that the subfield areas are regrouped according to user-specified criteria.” Support for it can be found in the specification from page 18, line 19 to page 20, line 8, and in the drawings at 1360. It should be noted that this feature allows the end user to change the grouping repeatedly, after the display has been configured, in different ways not preconfigured for purposes of envisioned research. This readily operable menu item feature in conjunction with the other claimed data exploration limitations further distinguishes the invention from the prior art as a superior, flexible, research tool (see the example below).

Claims 60-66, 71 and 78 comprise “displaying a menu item by which the criteria used for displaying data elements are automatically widened and narrowed.” Support for it can be found in the drawings at 334a and in the specification at page 19, lines 9-12 and page 20 lines 1-7. The closest Wattenberg comes to this concept is on column 17 lines 20-23, but that is considerably different. Wattenberg only contemplates manual selection of subfields to be displayed in a reconfigured map tree. This approach is not encompassed by the claims as now amended which recite automatic filtering. Wattenberg does not teach or suggest that the criteria used for displaying data elements in the tree map may be automatically widened or narrowed by the end user; this would require, for example, that in Fig. 2A of Wattenberg, the user could select a menu with “large cap stocks” and the entire display would be reconfigured. The claim language does not read on Wattenberg column 17 lines 20-23 because it recites a general purpose automatic filtering capability, wherein the user can widen and narrow the criteria under user control, criteria can be user-defined rather than hard-wired. For example, page 19 lines 10-12 of the application discloses that “the user could preferably specify that hotels above a certain price range be filtered from display” and multiple filters can be combined with each other.

Claims 59-66 and 78 comprise “providing an aural attribute associated with one or more subfield areas for indicating, via sound, a dimension of the data element for the subfield areas”. Support for it can be found in the specification at page 16 lines 13-14. Volume, pitch, timber, and other aspects of sound could be used. Wattenberg does not teach or suggest that an aural attribute can be used.

Claim 60-66 and 78 recite all the data exploration limitations recited above. As such, they define not only a tree map display system, but also a research tool or system with superior capabilities to anything in the prior art. For illustration, as exemplified in the specification on page 41 lines 4-15, two highlight criteria are presented, “Best Sellers” associated with a “!” symbol, and “Recommended for Espresso”, associated with a “\$”. Users could invoke “Best Sellers”, and also invoke “Recommended for Espresso.” In this case, some subfield areas might have only a “!” if they are only best sellers; some might have only a “\$” if they are recommended for espresso but not best sellers, and the subfield areas which are BOTH best sellers and recommended for espresso would have both a “!” and a “\$”.

Continuing with the above example, as discussed on page 19 of the specification, the user could first group the coffees by region, then highlight the “Best Sellers” in order to determine which regions sold the best, or regroup the coffees by flavor and then highlight the “Recommended for Espresso” brands, in order to explore the relationship between flavor and suitability for espresso. Other regroupings could be made by the user as needed to answer any other user-specific question regarding the represented coffees.

Continuing with the above example, a customer on a limited budget might first filter out very expensive coffees, and then proceed to group the coffees by flavor and then highlight the “Recommended for Espresso” brands.

Continuing with the above example, after the regrouping, filtering and highlighting have been carried out, the amount of caffeine in the coffee could be signified by volume when the cursor passes over it – the more caffeine in the coffee, the louder the sound. Accordingly, a user of the invention having the data exploration claimed features might customize in numerous ways researching a large number of variables underlying the tree map display. Similar capabilities are not found in the prior art.

Claims 73 and 77-79 comprise a limitation related to the assignment of color values in the subfield areas. Nothing in the prior art of record teaches or suggests assignment of color values as claimed in claims 73 and 77-79. Wattenberg teaches only that the color intensity is in proportion to the value of a data characteristic, that colors for each of the regions are green, red and black representing a positive, negative and neutral change in stock price, and that the color may indicate a positive or negative price change from the previous market day or from its 12-month low, etc. (claims 11 and 17, column 2 lines 44-54 and column 9 line 63 to column 10 line 16). Applicants respectfully point out that simply assigning color intensity in proportion to the value of a data characteristic, as in Wattenberg, permits a loss of visual detail when the values of the data characteristic range over many orders of magnitude, and that the algorithm in the invention scales more smoothly for highly variable data. Color shade variations obtained using the claimed color assignment procedure are more informative as to the

variability of the represented data. Moreover, whereas attributes in a shopping application are unlikely to range over 6, 7, or even more orders of magnitude, such attributes are commonplace in the data served by data exploration tools, wherein there can be a large number of unpredictable variables.

#### Other limitations

Regarding claim 24: claim 24 depends from claim 23 and is not anticipated or obvious over the prior art of record at least for the same reasons as claim 23. In addition, applicants amend claim 24 to recite the limitation that the data is stored remotely from the computer device, and that the computer device is a hand-held computer device, support for which can be found in the specification on page 9, line 1-5. Wattenberg does not teach or suggest that data is stored remotely from the computer device, nor that the computer device is a hand-held computer device. Arguments for claim 1 limitations 1-5 are applicable to claim 24 to the extent that a partitioned application with an active server component is necessary for supporting a tree map on a hand-held computer device, because the limited memory, processing power, and display space on such a device requires special tailoring of the client-server data flow in order to avoid overwhelming the device.

Applicants add claim 67 disclosing a method of processing user criteria to retrieve a portion of data and display it to the user, wherein partitioning of the method across a network between client computer and server computer is disclosed.

The first six steps, from “issuing a request for an application program...” to and including “on the server computer ...” clearly describe a partitioning of the application between a client computer and a server computer, and are not taught or suggested by the prior art of record. Applicants point out that the arguments under Active Server and Partitioned Application Thereby Created are applicable to claim 67 as well.



Applicants add claim 68 related to the subfield detail window and removal of the subfield detail window, support for which can be found in the specification at page 27 line 17 to page 29 line 7.

Applicants add claim 69 related to a Highlight box, support for which can be found in the specification at page 20 line 18 to page 21 line 9, and page 41 line 4-15. Applicants point out that the relevant portions of the arguments under Data Exploration are applicable to claim 69 as well.

Applicants add claim 70 related to a user-changeable grouping criterion, support for which can be found in the drawings at 334 and in the specification at page 18 line 20 to page 19, line2; page 19, lines 7-12; page 20, lines 8-17; and page 40, line 21 to page 41 line 1. Applicants point out that the relevant portions of the arguments under Data Exploration are applicable to claim 70 as well.

Applicants add claim 71 related to a “menu item by which the criteria used for displaying data elements are automatically widened and narrowed” support for which can be found in the drawings at 334a and in the specification at page 19, lines 9-12 and page 20 lines 1-7. Applicants point out that the relevant portions of the arguments under Data Exploration are applicable to claim 71 as well.

Applicants add claim 72 disclosing the limitation that the application is a server applet, support for which can be found in the specification on page 25 lines 4-13. Nothing in the prior art of record teaches or suggests that the application is a server applet. Applicants wish to emphasize that configuring the application as a server applet is qualitatively more difficult than a simple client-server application as in Wattenberg, since it is then able to be run on any computer system possessing a standards-compliant browser.

Applicants add claim 74 relating to the server applet being identified by HTML code, support for which can be found in the specification at page 25 line 3-6. Nothing in the prior art of record

teaches or suggests a server applet running in a virtual machine in a browser wherein a reference tag to the server applet is embedded in a web page containing HTML code, such that the HTML code identifies the server applet to the browser and provides one or more parameters necessary for the browser to receive and launch the server applet. The system of the invention has advantages over Wattenberg, specifically, the disclosed tree map application requires no installation step on the client machine, and can be run on any computer system possessing a standards-compliant browser, such as Internet Explorer, Netscape Navigator, or Opera, regardless of whether the computer system is a desktop, laptop, server, or hand-held device; PC, Macintosh, Unix or Linux machine; etc. Moreover, the embedding of the server applet within a web page allows the addition of information regarding the tree map, such as links to online help, operating instructions, information on products or services offered for sale, etc., without recompiling or otherwise changing the tree map application.

Applicants add claim 75 relating to a virtual machine implementing a browser-compatible language, support for which can be found in the specification at page 23 line 4-6. Nothing in the prior art of record teaches or suggests implementing a tree map in a browser-compatible language, such as Java, Perl, Flash, or JavaScript. The system of the invention has advantages over Wattenberg, specifically, the disclosed tree map can be run on any computer system with a browser possessing the required virtual machine.

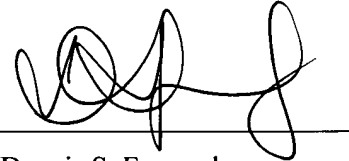
Applicants add claim 76 covering a hand-held computer device as the client computer, support for which can be found in the specification on page 9, line 1-5. Applicants point out that the relevant portions of the arguments under claim 24 are applicable to claim 76 as well.

Applicants add claim 79 depending from claim 78 further delineating an embodiment of the assignment of color values.

## CONCLUSION

Applicants respectfully submit that claims are in condition for allowance, and thus, reconsideration of the rejections is requested.

Respectfully submitted,



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